THE DISSIPATION OF THE SKILLED LABOR FORCE

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Abstract

Currently, the skilled labor industry is facing a huge gap in the number of working laborers. This gap is shown in the quickly declining numbers of workers in the trades and in the 7 million open jobs that are unable to be filled. Unfortunately, this is due to the general lack of interest in the trades, the lack of skills that individuals possess to excel in these fields, and individual attitude towards the trades that influence the decision to learn these skills. This gap affects companies and the amenities that they give to society. With a shortage of workers, many companies are shutting down because they are unable to complete the work needed. High school Career and Technical Education programs are a great way to gain awareness in this issue and begin to help this problem. There are a multitude of personal benefits for students linked to attending CTE programs as well, which in turn enhances their education. Public perception is a huge influencing factor in why the skills gap is so large today. On a refined level, perception directly impacts vocational school attendance, which is arguably the first steppingstone that many take into the trades. With lower vocational school attendance, there are automatically less individuals that enter into the trades which then contributes to the labor gap. In order to help with this issue, we first need to begin with understanding perception. This paper aims to begin to understand this.

Keywords: Skilled Labor Gap, Career and Technical Education, Perception

Introduction

Skilled labor provides us with many of the amenities our society uses every day. Without skilled labor, these amenities[1] would slowly start to disappear. Due to the skilled labor gap that our country is currently facing (Soricone, L, 2020. p. 5), diminishing amenities is slowly becoming our reality. This skilled labor gap is slowing down projects and leaving companies struggling to fill their open positions (Soricone, L, 2020. p. 5). Based on the severity of the effects of the skilled labor gap, it is important that we find ways in order to assist. A valuable and effective way to assist this is through high school Career and Technical Education programs (Soricone, L, 2020. p. 5). These programs offer students an effective way to train in a diverse variety of skills that are valuable for any career path they choose. Not only does CTE give students the ability to have a successful career in skilled labor, it also provides opportunities to successfully attend postsecondary education programs (Rosen, R., 2018. p. 3). Although they offer many benefits, CTE programs are severely underfunded and have incredibly low attendance rates. All characteristics of failure for CTE programs can be attributed to the perception surrounding them (Jackson, J. H., 2014. p. 2). In order to study this perception, I aimed to send a survey to parents and students of a select number of traditional and vocational schools throughout Massachusetts. This paper aims to outline my study and present options to assist in the CTE programs and the skilled labor gap.

Skilled Labor

[1] When thinking of the amenities that skilled labor provides, we can think of paved roads, indoor plumbing, and shopping malls.

When you think about skilled labor what do you think of? What probably comes to mind is construction workers, plumbers, and other individuals who perform physical labor. Although this is true, there are also many other forms of skilled labor; some that most people do not even think of. Skilled labor includes any job that requires a special skill, training, knowledge, or overall ability to complete. Along with construction workers, plumbers, and electricians; skilled labor encapsulates first responders, the culinary arts, machinists, and even accountants. To acquire these skills, individuals can attend a technical high school, college, university, learn the skills on the job, and through many other avenues as well (Hayes, A., 2021).

What is apparent when discussing these skilled jobs, are the benefits that they bring to society. Construction workers build the highways that we travel on and build/repair the homes that we live in. Culinary arts professionals cook the food that we eat. Plumbers not only install our plumbing systems but keep the systems within our structures running smoothly. Electricians maintain the power to our homes and maintain the electrical grid that powers everything. Could you imagine a world without the amenities that skilled labor provides?

Unfortunately, that is slowly becoming a reality. The United States is currently facing a shortage of skilled labor workers (Soricone, L, 2020. p. 5). As older generations retire and our country limits the awareness of these opportunities, it is only going to continue to grow. This gap is already having a negative effect on our world; it is slowing down projects, overworking understaffed skilled businesses, and driving up consumer costs (Soricone, L, 2020. p. 5). In order to keep these negative effects from getting worse, our country needs to find viable solutions to help the problem.

Career and Technical Education

Career and Technical Education, or CTE, is a form of educational programming that aims to integrate career education into academic coursework. An example of programs that follow these guidelines are full-time, high school CTE programs. These programs are sometimes referred to as vocational high schools where, students choose a specific concentration to develop skills relevant to this throughout their four years. Along with this vocational training, students also partake in traditional academics such as history, science, english, and math[2]. These programs keep the students in-line with traditional high-schoolers, while also giving them the ability to learn additional skillsets to benefit their future. Overall, CTE programs help students to prepare for any future they desire (Rosen, R., 2018. p. 3). Through this training, students will be prepared for not only the skilled labor force, but also postsecondary education if they choose (Bridging the Skills Gap, 2019). CTE programs also present mediums such as career centers, community colleges, technical colleges, four-year universities, and more to give students a multitude of diverse opportunities for success (What Is CTE?, 2021).

Benefits of CTE at a High School Level

Within my study, I focused on CTE at the high school level. This gave me the ability to study students and their parents within my survey. Overall, Career and Technical Education programs offer students a multitude of benefits (CTE Works!, 2021). While training in CTE, students gain specific technical[3] and academic skills that ready them for success in the workplace or in further educational endeavors (Soricone, L, 2020. p. 7). Partaking in CTE gives students the inspiration

[2] Some vocational schools use cycles of two weeks to organize their school days. This means that students spend two weeks at a time in career/shop learning environments, and then two weeks in strictly academic classrooms.
[3] Typically, students learn these technical skills in a shop environment. Here, they have access to the tools necessary to complete a multitude of projects while being guided by industry professionals.

and motivation to develop a multitude of skills that employers seek (CTE: Readiness for all Careers, 2020).

Educational Enhancement. Educational enhancement is a prominent benefit that comes from participating in CTE programs in high school (Penn Foster., 2017). Not only do students learn traditional academic curriculum, they also are taught skills in the form of a trade. This in turn, enhances their education and readies them for whichever future they choose upon graduation. Students can take their learned skills in both the academic and shop classrooms and apply them to each other and real-life experiences. In this sense, there are many instances where academic projects connect directly to their shop experiences. Figure 1 below shows that students report that the top three skills and experiences gained in CTE classes are skills that can be directly applied to jobs pursued in the future (CTE: Readiness for all Careers, 2020). Educational enhancement is also experienced through an increase in self-esteem, better grades, and more engagement in career and academic planning from students. Overall, students feel more motivated and engaged in their grades, future career, college aspirations, and employability skills (CTE: Readiness for all Careers, 2020).

Better Preparedness. During the hiring process, employers look for a multitude of skills within employees (CTE: Readiness for all Careers, 2020). According to the Association for Career and Technical Education (2020), there are 11 skills that employers most look for during the hiring process. These are professionalism/work ethic, teamwork/collaboration, oral communications, critical thinking/problem solving, written communications, ethics/social responsibility, information technology application, lifelong learning/self-direction, diversity, creativity/innovation, and leadership. Throughout time in a CTE program, students practice these

skills in various ways. While students participate in the shop environment, they are participating in work-based learning. In this environment, students gain exposure in work environments and become ready for employment upon graduation. Through their work-based learning, students also gain valuable problem-solving skills, project completion, research, communication, time management, and critical thinking all while in high school(CTE: Readiness for all Careers, 2020).

Some vocational schools also offer co-op programs where students can get jobs that they go to instead of attending school (Technical Programs, 2019). There are also various types of programs that offer real jobs that students can work on. For example, a carpentry department can be hired to re-shingle a house. Throughout this job, grades levels rotate through and take turns traveling to the jobsite during school hours and practice their skilled trades. Other examples of

Figure 1 – Readiness for all Careers
(CTE: Readiness for all Careers, 2020)

this hands-on learning style would be a health careers shop traveling to a nursing home to help with their duties, an automotive shop running their own garage through the school, and the culinary shop running their own restaurant through the school. An example of a school that utilizes these learning programs is Old Colony Regional Vocational Technical High School in Rochester, Massachusetts (Technical Programs, 2019). The school is on the smaller side, having 13 shops in total. Each shop is unique to one another and utilizes a shop environment in order to assist with student learning. Through these examples, students are given the ability to practice their skills which prepare them for a future in the labor market. These programs also give students real-life experience that they can directly compare to future experiences in the labor market.

Opened Opportunities. By participating in CTE, students immediately open new doors for themselves upon graduation (Penn Foster., 2017). Differing from traditional high schools, CTE teaches skilled trades alongside traditional academic coursework. This doubles the career paths that students have the ability to take. While participating in CTE, students can engage and develop skills that help them to succeed in any environment that they choose to go into upon graduation (Rosen, R., 2018. p. 3). Referring to Figure 1 above, the skills that employers search for not only prepare students for the skills that employers seek, but also readies students for a future in postsecondary education if they choose.

Not only does CTE participation open more opportunities in the realm of post-graduation, but during their time in high school, students have a vast list of skilled trades to choose from. These are considered career clusters and are illustrated in a diagram below in Figure 2 (What Is CTE, 2021). Created by ACTE (2020), this infographic aims to educate individuals about the many

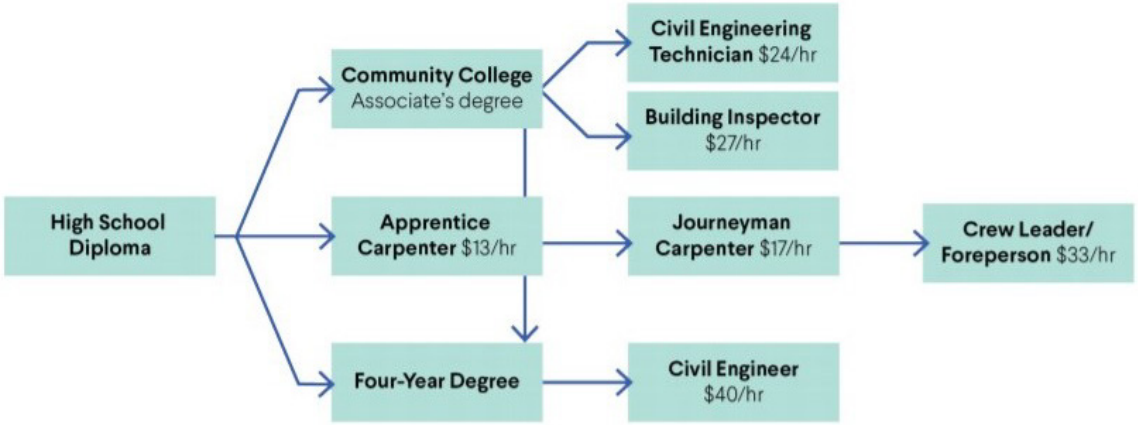
different careers that can be achieved through CTE education. Through CTE, students can choose career pathways in STEM, architecture and construction, manufacturing, agriculture, and many others (What Is CTE, 2021). Using the construction industry as an example in Figure 3, we can look more closely and see the separate career pathways within the construction industry. It can be seen in Figure 3 below that just a high school diploma opens the doors already to 3 separate pathways for students (Soricone, L, 2020. p. 5). Upon graduation from high school,

Figure 2 – Career pathways in construction upon graduation from high-school (Soricone, L, 2020)

students can already be making $13 an hour, which goes up as they advance through the rankings.

Figure 3 – Clusters that high school CTE concentrators can choose from. (What Is CTE, 2021)

Lower Cost Pathway. As discussed above, practicing career and technical education in high school opens a multitude of pathways for individuals upon graduation (What Is CTE, 2021).



Looking specifically at pathways that involve working in skilled labor, students can earn high paying wages while avoiding student debt that is associated with college. As of 2018, college debt averages close to $30,000 per student (Soricone, L, 2020. p. 11). Comparatively, construction trade workers in 2018 earned an average of $49,000 or more while working (Soricone, L, 2020. p. 11). This proves to be a successful pathway after high school, all without a college degree.

Lacking Enrollment

Even with all of these benefits, enrollment in trade CTE programs is still lacking. Of the students that are currently enrolled in high school, only 38 percent can be considered concentrators (CTE Today, 2021). Concentrators are students who focus specifically on a certain specter of skilled labor. Among more than 15 million high school students, 32 states reported more than 870,000 enrolled in trades education. This is only 5.8 percent of students who participate and have the clear potential of a future in skilled labor (Soricone, L, 2020. p. 16). I perceive the contributors of this lack of enrollment to be lack of funding to CTE programs and lack of schools. These two items play a great deal in the interest and access surrounding attending CTE programs.

Lack of funding. Career and Technical Education programs are very expensive to run (Soricone, L, 2020. p. 38). A trade program such as carpentry requires all of the expensive equipment and consumable items necessary to effectively practice skills. Some of the expensive equipment may include CNC machines, various saws, hand tools, etc. The main consumable items for a construction shop could be wood products, various types of finishes, and an assortment of construction products. The level of difficulty to fund these schools leads to this lack of funding. Unfortunately, this is a double-edged sword. Lack of funding leads to a decrease

in enrollment while this lack of enrollment leads to even further decreases in funding (Soricone, L, 2020. p. 38). Parents do not want to send their child to underfunded schools just as much as the students do not want to go themselves[4]. When these schools cannot afford to fund successful and effective CTE programs for their students, it can be led to believe that this causes a decrease in interest in these programs. This leads to a lack of student enrollment.

Lack of schools. There is a severe lack of vocational schools within the United States (Soricone, L, 2020). Figure A-7 represents the number of schools in the United States as of 2018/2019 (Soricone, L, 2020). It is surprising to the see the drastic differences when comparing vocational high schools and traditional high schools. On this graph, there are 90,019 traditional high schools while there are only 1,507 vocational schools. Vocational schools make up the least amount on this chart.

I believe that lack of schools plays a huge role in student enrollment. How are students going to be able to access these schools when they do not have access to any nearby? Based off information collected from NCES (2020), we have the ability to compare vocational school access across counties in New England. Keep in mind, a county is made up of several cities or towns. Appendix C shows the information that was collected about all New England States (National Center for Education Statistics, 2020). In New England, New Hampshire is the only state that has at least one vocational school in each county. All the other states researched contain multiple counties with no vocational schools. When thinking of the counties without a vocational school, it is not difficult to imagine the struggles for students to attend vocational

[4] There are vocational schools that are so underfunded, they still have dirt tracks and are unable to have certain sports teams.

schools when they live in such counties. Attending one of these schools sometimes means to travel towns over, multiple times a day. For families where traveling these distances is not an option, they would simply be unable to attend.

Relating Skilled Labor and CTE

Career and Technical Education programs are a vital source for the skilled labor force (Soricone, L, 2020. p. 5). By educating students on the topic of skilled labor and getting them involved, it can pave a perfect pathway for students who choose to take it. This pathway aligns with the trades upon graduation. Skilled labor is a viable option for students who do not want to attend college, or who just simply want to work in the trades. It provides well-paying and fulfilling careers for many individuals, often with a lot of opportunity for growth (Soricone, L, 2020. p. 5). There are arguments that individuals can join skilled labor further in life without having to attend a CTE program to get there. I agree, but CTE programs ensures that students are successful with this transition. This is because they are practicing their skills and preparing for life upon graduation. By introducing all students to CTE, we can ensure that they are ready for any path they choose upon graduation; college or the workforce. It is important to remember, being prepared for college is not the same as being prepared for a successful transition into the workforce (Stone, J. R., III., 2014. p. 2). Traditional education is simply not setting students up for this successful transition. 35% of employers have said that they are having trouble hiring based on their applicants not having the right skills (Rosen, R., 2018. p. 2). This is a huge number that represents the lack of training that individuals are receiving. By providing all students with the opportunity to learn about skilled labor and practice it early in their high school career, we can expect to see success in closing the skilled labor gap (Soricine, L, 2020. p. 5).

The Skilled Labor Crisis

Skilled trade jobs make up for over 11 million workers in the United States (Soricone, L, 2020. p. 11). Within these 11 million workers, there is a clear and steady increase in the need for workers in these skilled trades. This is due to an underlying skills gap that the United States is currently facing. According to the Bureau of Labor Statistics (2018), there are more than 7 million open jobs across the country (Mike Rowe Works, 2018). Although the majority of these jobs do not require a college degree, our society continues to push college education for every high school graduate; only adding on to the combined trillions that are already owed in student loans (Mike Rowe Works, 2018). Not only is the skills gap growing wider, but skilled trade jobs have also remained the hardest to fill for the past decade (Soricone, L, 2020. p. 11). It is more important than ever to increase awareness of the importance of skilled trade labor. The best way to do this is through high school CTE programs.

How does CTE benefit the Skilled Labor Gap?

Knowing that CTE is an important and viable option for the skilled labor gap, we should be pushing CTE more to students. Currently, student enrollment in trade courses does not align with the needs for trades workers. According to Figure A-8, the current student enrollment in trade courses does not align with the need for positions that will open in the coming decades (Soricone, L, 2020. p. 19). With the current way that CTE programs are perceived, they are not attracting anywhere near enough enrollments, with a total of 13% of students able to meet these needs. By encouraging attendance in these programs, we can assist the skills gap by providing a straight path for students to take if they desire to. Through attendance in these CTE programs at a high school level, we can truly begin the attempt to close the skilled labor gap.

Contributors

Although there are many contributors to the skilled labor gap, it all leads back to perception. Lack of individuals to fill retiring positions, the push for a college education, falling enrollment, lack of schools, lack of skills all leads back to that of perception. Vocational education and labor have always been plagued with the perception that it is second rate (Jackson, J. H., 2014. p. 2). This perception has proven to have a negative impact in both skilled labor and CTE program enrollment. As discussed above with the skilled labor gap and lacking CTE enrollment, perception plays a large contributing factor.

Perception

Perception of career and technical education along with perception of skilled labor in general is a large contributor in the skills gap today. It is often observed by individuals that CTE programs are seen as the "neglected step-child' of education; meaning it is often ignored and seen as disadvantageous (Jackson, J. H., 2014. p. 1). In interviews conducted in the *Breaking Ground (2020)* study, it is reported that more often than not, interviewees routinely reported trade education to be associated as dirty and leading to dead-end jobs (Soricone, L, 2020. p. 7). With these perceptions, we often see many families overlook quality education for their children, limiting their opportunities in the future (Soricone, L, 2020. p. 11).

I believe that perceptions similar to this are the driving force of the skills gap and lack of attendance in CTE programs. When looking at all possible contributors, we can begin to draw lines to one another and see that they all lead back to the same place. The push for a college education is a large contributor of the skilled labor gap. This push for college directly translates to the belief that a high-school degree holds little value in the labor market **(**Stone, III, J. R.,

2005. p. 2). This societal push for college impacts the attendance of CTE programs due to the belief that upon receiving a CTE degree, college is not an option (Jackson, J. H., 2014. p. 3).

Through personal experience and the lack of attendance in CTE programs, there is an obvious negative connotation towards it. These negatives are very wrong and along with the benefits discussed above, we can see that there are many more; such as graduation rates, high salaries, and opportunities for postsecondary education.

Salaries

It is often believed that individuals working in skilled labor have lower paying jobs than that of college graduates (Soricone, L, 2020. p. 7). Through this, many individuals believe that pursuing trades is not worth it. Contrary to this popular belief, this is not true. According to the United States Department of Education (2019), individuals who graduate from CTE programs and individuals who graduate from traditional programs make a comparable amount to one another (Bridging the Skills Gap, 2019). Figures A-1 and A-2 show the comparable numbers among these groups of graduates. Although very close, CTE program graduates tend to make more than individuals who graduate from traditional programs.

To take a look at salary information further, we can look at Figures A-3 and A-4. The first of these figures shows the average salaries of a multitude of sectors within the construction industry. These salaries are all well-paying, with the highest being a Project Manager (NCCER., 2018). Comparing this directly with the next figure, we can compare these salary numbers directly to the average salaries of bachelor degree graduates. Although still well-paying, they still make comparable amounts to one another (National Association of Colleges and Employers, 2021). This proves that the argument stands that it is possible to make good money in the skilled

labor force without the necessary college education. Using construction as an example again, a student can begin in a construction program within a high school CTE school and work their way up the ladder; all while making great money.

Graduation Rates

In interviews with CTE program leaders, it was identified that there is widespread stigmatization that it is a place for low-performing students to attend high-school. It is also not expected for these students to want to continue their education or take it seriously (Soricone, L, 2020. p. 36). Within these stigmatizations, we can expect that these programs have lower graduation rates as well. Just as perception surrounding salaries was incorrect, perception surrounding graduation information is incorrect as well. Graduation rates from CTE concentrators are actually higher than those of non-CTE concentrators. In Figure A-5, we can see that graduation rates from CTE concentrators are 94% versus the 86% average graduation rate of traditional high-school students (Bridging the Skills Gap, 2019). It can be argued that because of the high-quality education that is received through CTE programs, students are more engaged in their education. Participation in CTE programs is associated with reduced dropout rates and higher graduation rates in general (CTE Works!, 2021). This proves that participating in a CTE program is more beneficial for student success.

Postsecondary Education

Originally, vocational training was designed as an alternative path to college (Rosen, R., 2018. p. 10). It is no surprise that this led to the belief that college is not an option upon graduation (Jackson, J. H., 2014. p. 2). Since college is such a pushed ideal for high school graduates, students feel like they have no other options at graduation. It is not true that a student is not

prepared for a college education once they graduate from a CTE program. In figure A-6**,** we can see that many CTE concentrators attend college once they graduate. This number is actually higher than those who partake in a traditional education (Bridging the Skills Gap, 2019). This proves that the belief that college upon graduation from a CTE program is in fact possible.

These three perceptions add on to the previously discussed benefits for a vocational education. Overall, CTE program participants are more likely to graduate, attain employment and earn higher wages, and are just as likely to pursue a four-year degree as their peers (CTE Works!, 2021). With this extensive list of benefits, CTE programs and skilled labor is a great option for students and should be pursued more.

The Study

Throughout the course of my research in CTE and the skills gap, it became clear that the two can help each other in many ways. As discussed in this paper, there is a plethora of evidence illustrating the benefits of career and technical education, so why not start at the high school level. For this study, I researched high school students and their parents to gauge their perception of skilled labor. As a part of my thesis, I decided to survey the parents and students of traditional and vocational high schools. In this survey, I would like to determine the perception of these individuals. With this information, I would be able to determine how these individuals' perception affect CTE participation. And most importantly, if these perceptions change with generations.

Methodology

In order to ensure that I picked schools fairly, I developed a process that I followed throughout the selection process. Throughout the selection process, it was important that I remained unbiased. First, I gathered data throughout two websites; the United States Census website (Bureau, U. S., 2020) and the NCES website (National Center for Education Statistics, 2020). In the next step of selecting counties, I made sure to refer back to this data as I followed my methodology. The last step I completed was the actual selection of these schools. There were also a number of assumptions made prior to the study that I will discuss later in this paper.

Step 1 – Gathering Data. I began by gathering the data of each state in New England. This data started with each states number of counties and their populations. To gather this information, I used the United States Census website (Bureau, U. S., 2019) as well as the NCES website (National Center for Education Statistics, 2019). The census website provided me with the population information broken down by county. The NCES website provided me with all of the school information for each county. This information was number of vocational schools, number of traditional schools, student populations, and much more information. All of the information collected is as of 2019.

Step 2 – Selecting Counties. Next, I began to select the counties that I would use in each state. To choose these counties, I created a set of rules. I decided to select the most populated and least populated counties in each state given that they meet the requirement of having 2 or more vocational schools. If the most populated and least populated county do not fit this criterium, the process of selecting schools will be in ascending/descending order respectively. Within each of the states, the counties chosen are as follows: Massachusetts – Middlesex County (largest) and Barnstable County (smallest), Rhode Island – Providence County (largest) and Kent County

(smallest), Connecticut – Fairfield County (largest) and Windham County (smallest), Vermont – Chittenden County (largest) and Windsor County (smallest), New Hampshire – Hillsborough County (largest) and Coos County (smallest), and Maine – Cumberland County (largest) and Aroostook County (smallest).

Step 3 – Selecting Schools. Once I had chosen the counties, I began the process for choosing the schools. At this point, I decided to choose 2 schools from each county: meaning 4 schools per state and 24 schools in total. This would give me the ability to have a wide range of input from my survey. Like the counties, I decided to choose a vocational and traditional school with a large population and a vocational and traditional school with a small population. The larger schools needed to contain 500 or more students, and the smaller schools needed to contain less than 500 students. Along with this, the vocational school and traditional schools with the largest population must closely match. For example, the smallest vocational school from Middlesex county must match closely in population to the smallest traditional school from Middlesex county.

There were a number of requirements that needed to be met in order to choose these schools. These are: if there are no schools in the large student population category, the largest school will be chosen. If there is no school in the small student population category, the smallest school will be chosen. Populations of the vocational school and traditional school must closely match. When there is more than one vocational school to choose from in the larger category, the largest will be chosen. When there is more than one vocational school to choose from in the smaller category, the smallest one will be chosen. Since there is a limited number of vocational schools, the vocational schools will be chosen first and the traditional school will be chosen to match the

vocational school. If there is not a vocational school to match the student population of a regular school, the next closest school will be chosen to ensure accurate data (within +/- 100).

Assumptions. In order to ensure that I wasn't missing any aspects for my survey, I made a number of assumptions. These include: schools will be chosen based on available public data, meaning that states without available public data will be omitted. Schools must only include grades 9-12. Charter schools are omitted. I only looked at schools within the identified county, not individual school districts. We will not be surveying/interviewing teachers. Because of the first assumption, I had to narrow my survey scope to just Massachusetts. Along with the lack of available public data and the time limitation that I faced; Massachusetts was the only state that I was able to study at this time.

Survey

For the surveys, I chose to ask questions that would help to see the perception of vocational education and what influences this perception. All of these questions fell into three main categories. The first category is organizational. Organizational questions are just for ease of sorting responses in the future. The next category is behavioral questions. These questions will help me gauge the behaviors of students and parents in regard to high school education. The last category is emotional questions. These questions will help me gauge the emotion of students and parents in regard to how they feel about their high school education. Through these questions, I will be able to understand the perception surrounding vocational high schools on the level of parents and their students. The survey that I sent out is part of Appendix C.

Organizational Questions. For the parent survey, the beginning questions were organizational. These questions were just to assist in helping me with organizing the responses.

With these, I could determine things such as the grades of their children, what school they attend, what category their school falls under, and if there are vocational schools where their child can attend. The student survey asked the same questions, these being what grade and school they attend. Again, this just helps me with organization. By asking these questions for both groups, I can also match responses between parents and students and determine patterns.

Behavioral Questions. When referring to behavioral questions, questions about individual actions or involvement are asked. When asking these questions, I mostly looked at the factors which influenced attendance to their school. For parents, the questions included factors that influenced their child's choice in attendance. Students had slightly different questions, these being factors that influenced their choice in attendance, as well as ease of information and application, option to take CTE focused classes, and if the student plan on attending college. Through these questions, I hope to gauge the information that parents and students have access to, as well as non-emotional factors that influence their decisions.

Emotional Questions. The emotional questions of the surveys were where I will gauge the perception of vocational schools from these individuals. For parents, these questions included if they resisted a vocational education and why, what assumptions they have regarding traditional/vocational education, belief in the value of traditional/vocational education, how they measure their child's success, and if they believe their child is currently happy in their school. For the students, I asked questions such as if they are happy in their current program, if they believe that their current education will benefit their future success, and if they plan to pursue a career in skilled labor regardless of program. By asking these questions I hope to see how each

group feels about traditional and vocational education. Through this, we can see a generational change in perception if there is one.

Future Steps

Due to the pandemic and the time limitations faced on this study, I had to narrow my scope to just Massachusetts. Also due to the pandemic, I had issues with getting my survey out to the schools and receiving results. I believe that the challenges of online learning greatly attribute to this. In the future, I would like to attempt to get survey results again, as well as broaden my scope to New England. Once I continue this research, I will be able to have much more time as well, so I will have the ability to take on a much larger scope. A larger scope will include more states and expanding the survey to faculty and teachers.

Conclusion

One of the most beneficial and effective solutions to the looming skilled labor gap is increasing awareness of high school Career and Technical Education programs. There are many benefits to these CTE programs, both for the students and the skilled labor gap. In order to understand why there is decreasing attendance in these CTE programs, we must begin to try and understand the perception surrounding skilled labor and CTE programs. In order to study this perception, I began by creating a survey to send to parents and students of both traditional and vocational high schools. Once I send this survey out, I will begin to compare the data and determine what individuals think of CTE programs. Most importantly, I would like to see if there is a generational gap between the views of parents and their children. This is the first step to helping with attendance in CTE programs, then helping the skills gap.

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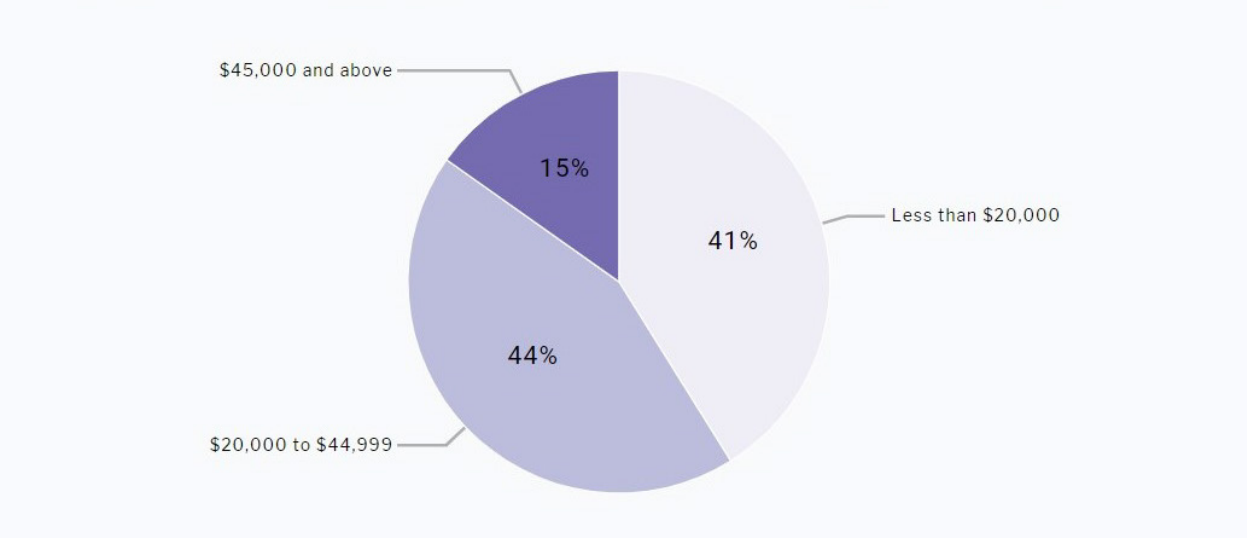
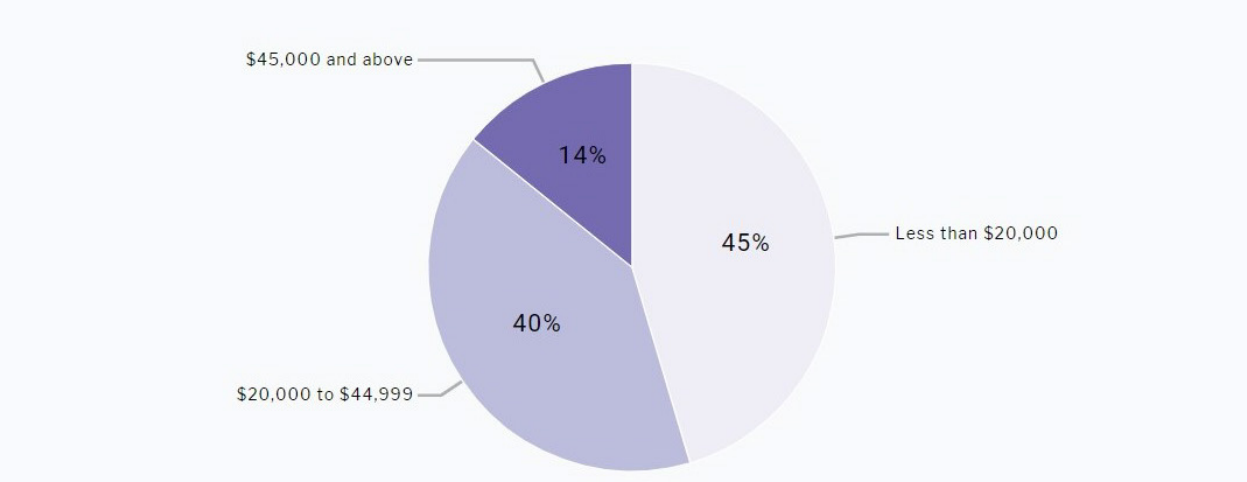
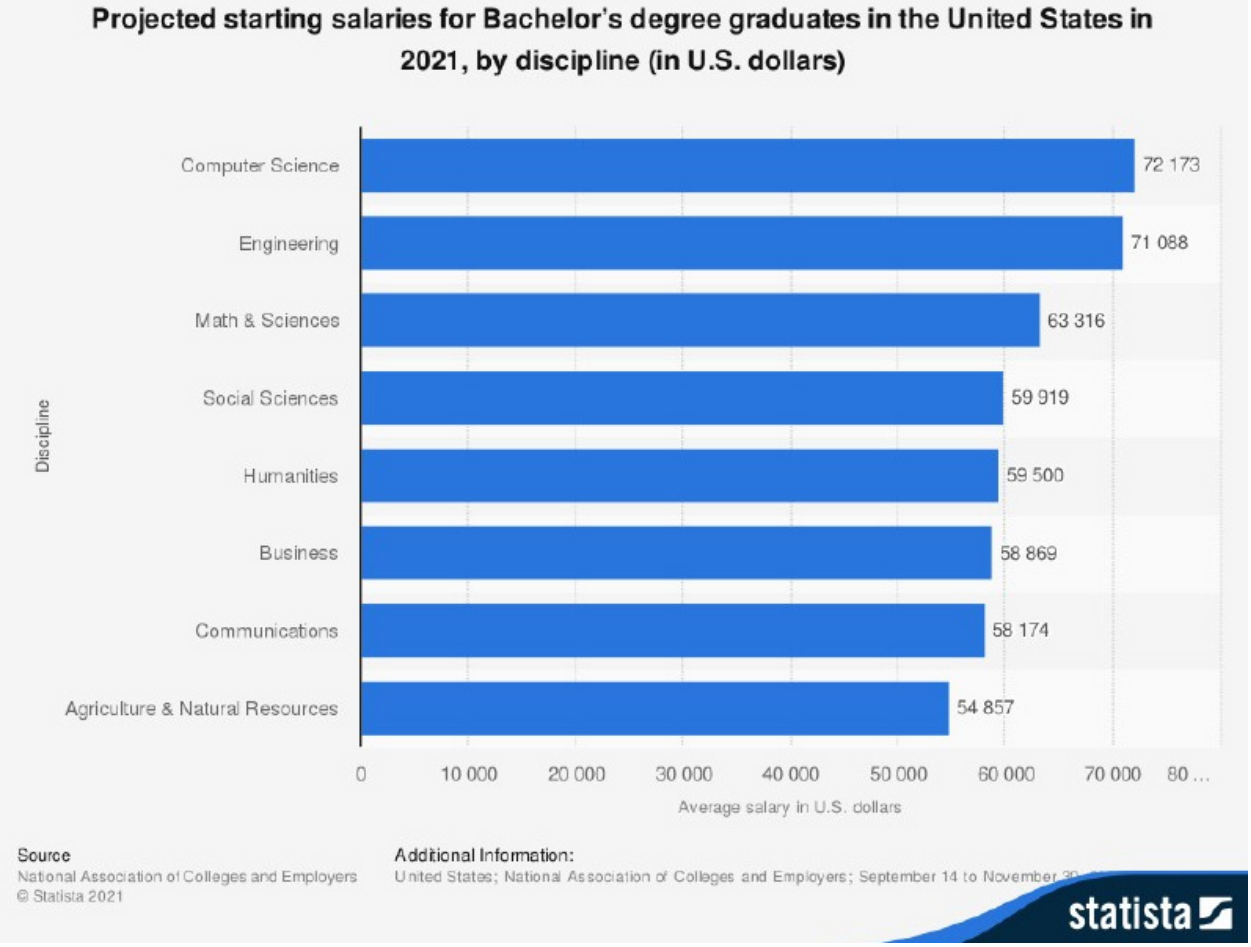
Appendix A: Statistical Data



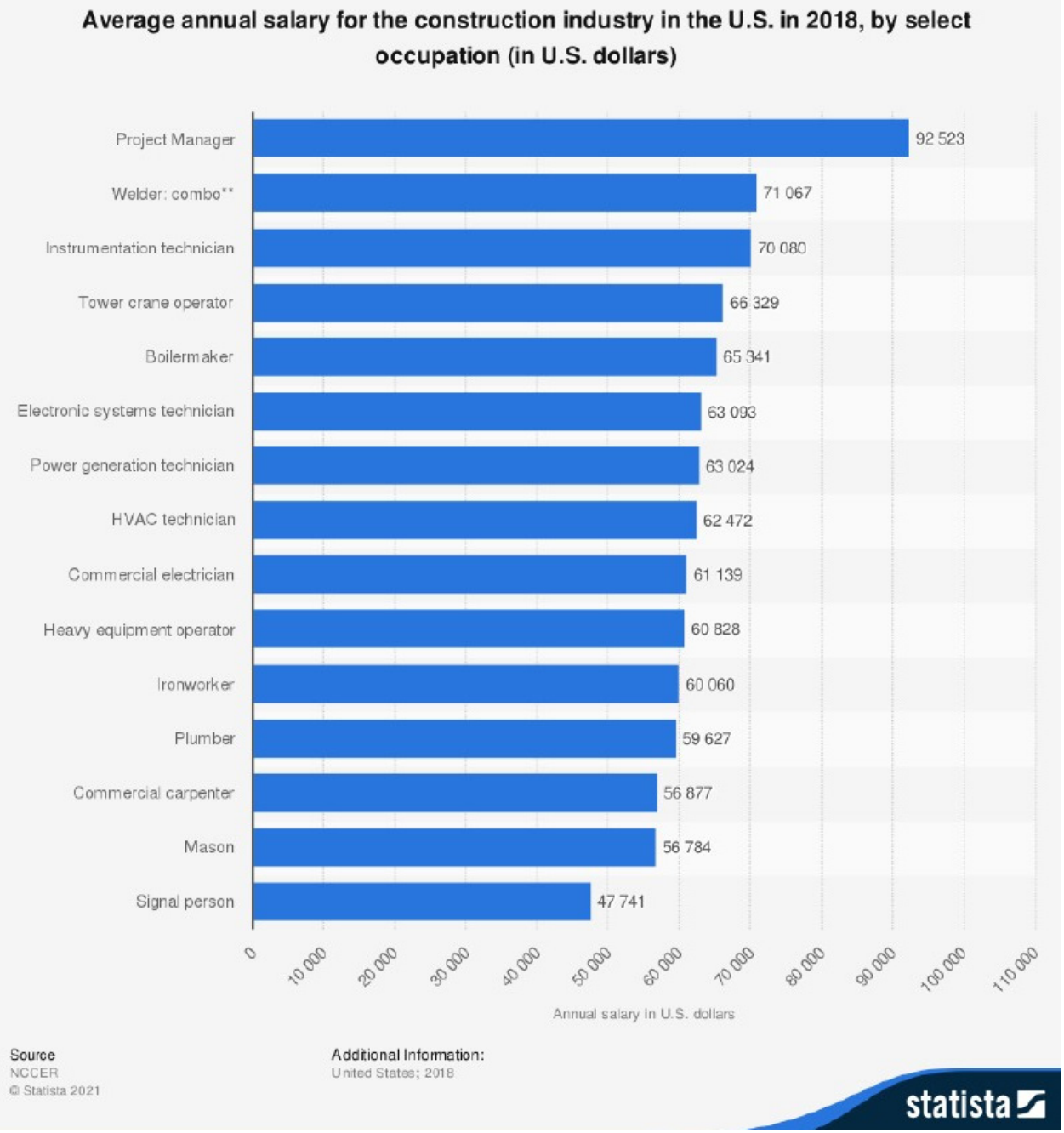
A - 1 – Percentage distribution of high school CTE concentrators by employment earnings – eight years after expected high school graduation.
(Bridging the Skills Gap, 2019).



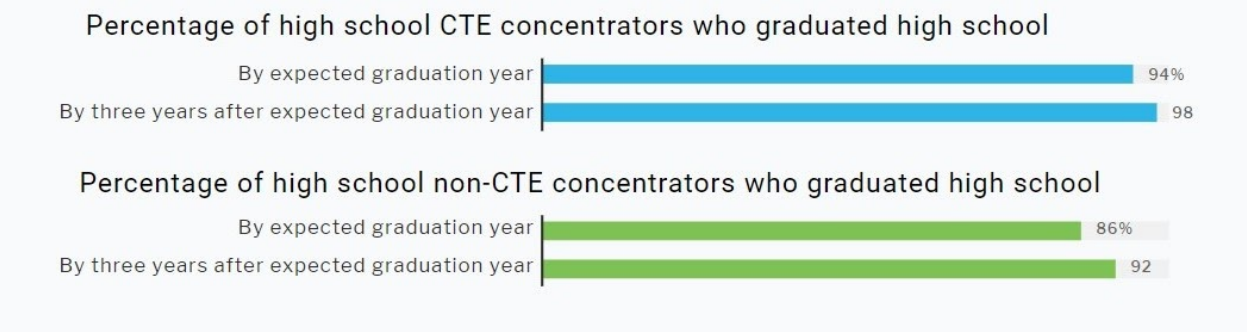
A - 2 – Percentage distribution of high school non-CTE concentrators by employment earnings eight years after expected high school graduation.
(Bridging the Skills Gap, 2019).



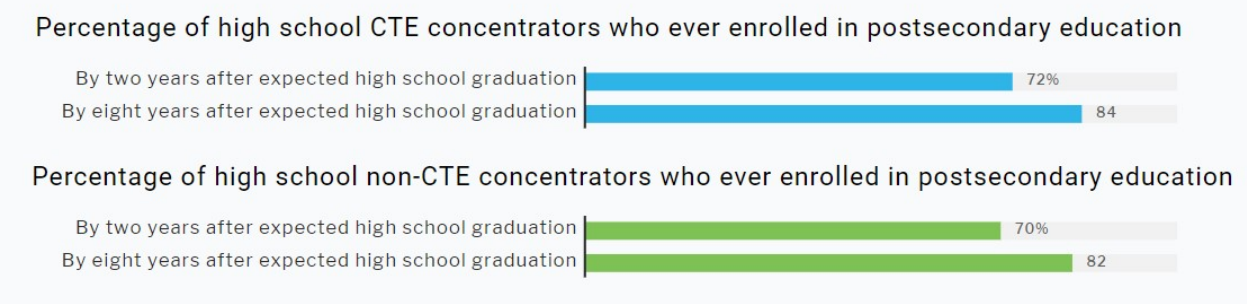
A - 3 – Projected starting salaried for Bachelor's degree graduates in the United States in 2021, by discipline (in U.S. dollars)
(National Association of Colleges and Employers, 2021)



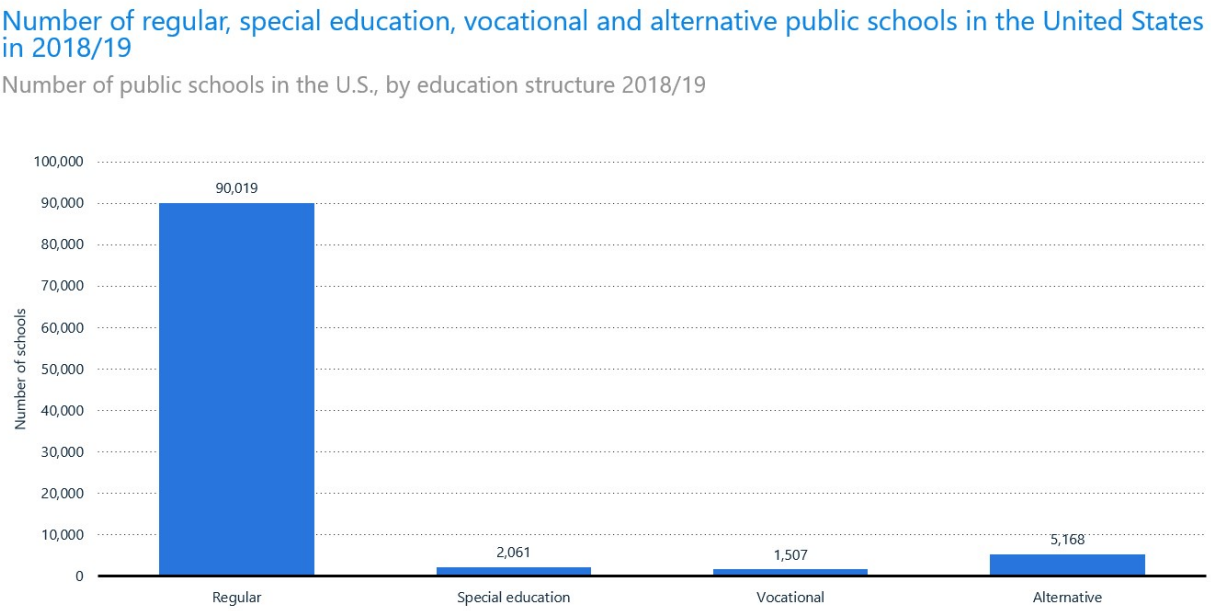
A - 4 – Average annual salary for the construction industry in the U.S. in 2018, by select occupation (in U.S. dollars)
NCCER. (December 12, 2018).



A - 5 – Percentage of high school CTE concentrators and non-CTE concentrators who graduated high school
(Bridging the Skills Gap, 2019).



A - 6 – Percentage of high school CTE concentrators and non-CTE concentrators who ever enrolled in postsecondary education
(Bridging the Skills Gap, 2019).



A - 7 – Number of regular, special education, vocational and alternative public schools in the United States in 2018/19
(NCES, 2020).

Figure 8. Average Annual Openings 2018-2028 and 2011 Freshman Cohort Concentrators, (*n* = 13 states)[40]

Trade Area	Average Annual Openings 2018–2028	Concentrators	Concentrators as a Percentage of Openings
Construction	166,515	9,051	5%
Advanced Manufacturing	77,705	8,591	11%
Automotive	36,447	15,648	43%
Carpentry	30,024	6,724	22%
Electrical	28,245	3,210	11%
Plumbing	20,078	660	3%
Welding	17,822	5,795	33%
HVAC	14,142	1,115	8%
Total	**390,978**	**50,794**	**13%**

A - 8 – Average Annual Openings 2018-2028 and 2011 Freshman Cohort Concentrators (Soricone, L, 2020)

Appendix B: New England State Data

United States Census website (Bureau, U. S., 2020) and the NCES website (National Center for Education Statistics, 2020)

Massachusetts 2019			
Geographic Area	**Population**	**Number of Vocational Schools**	**Number of Traditional Schools**
Total Population	**6,892,503**	**36**	**233**
Middlesex County	1,611,699	7	46
Worcester County	830,622	6	35
Suffolk County	803,907	1	23
Essex County	789,034	4	31
Norfolk County	706,775	3	24
Bristol County	565,217	5	14
Plymouth County	521,202	2	23

Hampden County	466,372	3	18
Barnstable County	212,990	2	6
Hampshire County	160,830	1	6
Berkshire County	124,994	1	4
Franklin County	70,180	1	1
Dukes County	17,332	0	1
Nantucket County	11,399	0	1

Rhode Island 2019			
Geographic Area	**Population**	**Number of Vocational Schools**	**Number of Traditional Schools**
Rhode Island	**1,059,361**	**10**	53
Providence County	638,931	6	35
Kent County	164,292	2	7
Washington County	125,577	1	5
Newport County	82,082	1	4
Bristol County	48,479	0	2

Connecticut 2019			
Geographical Area	**Population**	**Number of Vocational Schools**	**Number of Traditional Schools**
Connecticut	**3,565,287**	**17**	159
Fairfield County	943,332	3	35
Hartford County	891,720	3	37
New Haven County	854,757	5	37
New London County	265,206	2	13
Litchfield County	180,333	1	9
Middlesex County	162,436	1	11
Tolland County	150,721	0	9
Windham County	116,782	2	8

Vermont 2019			
Geographical Area	**Population**	**Number of Vocational Schools**	**Number of Traditional Schools**
Vermont	**623,989**	**15**	24
Chittenden County	163,774	2	8
Washington County	58,409	0	2
Rutland County	58,191	1	2
Windsor County	55,062	2	3
Franklin County	49,402	1	1
Windham County	42,222	0	2
Addison County	36,777	1	1
Bennington County	35,470	1	1
Caledonia County	29,993	0	0
Orange County	28,892	1	0
Orleans County	27,037	1	2
Lamoille County	25,362	1	2
Grand Isle County	7,235	0	0
Essex County	6,163	0	0

New Hampshire 2019			
Geographical Area	**Population**	**Number of Vocational Schools**	**Number of Traditional Schools**
New Hampshire	**1,359,711**	28	81
Hillsborough County	417,025	5	24
Rockingham County	309,769	4	11
Merrimack County	151,391	2	7
Strafford County	130,633	3	7
Grafton County	89,886	2	11
Cheshire County	76,085	1	6
Belknap County	61,303	2	4
Carroll County	48,910	2	3
Sullivan County	43,146	4	1
Coos County	31,563	2	7

Maine 2019			
Geographical Area	**Population**	**Number of Vocation**	**Number of Traditional Schools**
Maine	**1,344,212**	27	94
Cumberland County	295,003	4	19
York County	207,641	2	8
Penobscot County	152,148	3	12
Kennebec County	122,302	2	9
Androscoggin County	108,277	1	6
Aroostook County	67,055	5	7
Oxford County	57,975	2	5
Hancock County	54,987	1	5
Somerset County	50,484	1	5
Knox County	39,772	1	2
Waldo County	39,715	1	4
Sagadahoc County	35,856	1	3
Lincoln County	34,634	0	2
Washington County	31,379	2	3
Franklin County	30,199	1	3
Piscataquis County	16,785	0	1

Appendix C: Survey

Student

What Grade are you currently in?

- ○ 9
- ○ 10
- ○ 11
- ○ 12

What school do you attend?

Do you currently attend a traditional high school or a vocational high school?

- ○ Traditional
- ○ Vocational

What shop are you in? Enter N/A if you currently attend a traditional school.

What 3 factors mainly influences your choice to attend this school?

- ○ Friends
- ○ Location
- ○ Parent Influence
- ○ Eligibility
- ○ Shop Interest
- ○ Shop Options
- ○ School Size
- ○ Sports
- ○ Extracurricular Activities
- ○ School Funding
- ○ Available Information on School

- ○ Advertising
- ○ Sibling Attendance
- ○ Other

I am ultimately satisfied with the choice of school.

- ○ Strongly agree
- ○ Somewhat agree
- ○ Agree
- ○ Neither agree nor disagree
- ○ Somewhat disagree
- ○ Disagree
- ○ Strongly disagree

My parents/guardians decided what school I currently attend.

- ○ Strongly agree
- ○ Somewhat agree
- ○ Agree
- ○ Neither agree nor disagree
- ○ Somewhat disagree
- ○ Disagree
- ○ Strongly disagree

Did the middle school you previously attend share information about vocational high schools in your area?

- ○ Yes
- ○ No

If you applied to a vocational school, was the process of applying easy?

- ○ Yes
- ○ No
- ○ N/A

If you answered yes to the previous question, how did you learn information about vocational schools in your area? Select all that apply.

- ○ Handouts
- ○ Counselors
- ○ Social Media
- ○ Guest Speakers
- ○ Field trips
- ○ Other
- ○ N/A

I wish I had gone to a vocational school.

- ○ Strongly agree
- ○ Somewhat agree

- ○ Agree
- ○ Neither agree nor disagree
- ○ Somewhat disagree
- ○ Disagree
- ○ Strongly disagree
- ○ I currently attend a vocational school

I wish I had gone to a traditional school.

- ○ Strongly agree
- ○ Somewhat agree
- ○ Agree
- ○ Neither agree nor disagree
- ○ Somewhat disagree
- ○ Disagree
- ○ Strongly disagree
- ○ I currently attend a traditional school

I currently have options to take vocational classes in my traditional school.

- ○ Yes
- ○ No
- ○ I currently attend a vocational school

If you answered yes to the previous question, what vocational classes are available for you to take?

I believe that my traditional education will benefit my future success.

- ○ Strongly agree
- ○ Somewhat agree
- ○ Agree
- ○ Neither agree nor disagree
- ○ Somewhat disagree
- ○ Disagree
- ○ Strongly disagree
- ○ I currently attend a vocational school

I believe that my vocational education will benefit my future success.

- ○ Strongly agree
- ○ Somewhat agree
- ○ Agree
- ○ Neither agree nor disagree
- ○ Somewhat disagree
- ○ Disagree
- ○ Strongly disagree

- ○ I currently attend a traditional school

Because I attend a vocational school, I now see myself pursuing a career in the skilled labor force upon graduation.

- ○ Strongly agree
- ○ Somewhat agree
- ○ Agree
- ○ Neither agree nor disagree
- ○ Somewhat disagree
- ○ Disagree
- ○ Strongly disagree
- ○ I currently attend a traditional school

Even though I went to a traditional school, I see myself pursuing a career in the skilled labor force upon graduation.

- ○ Strongly agree
- ○ Somewhat agree
- ○ Agree
- ○ Neither agree nor disagree
- ○ Somewhat disagree
- ○ Disagree
- ○ Strongly disagree

- ○ I currently attend a vocational school

I am happy with my current vocational training at the school I attend.

- ○ Strongly agree
- ○ Somewhat agree
- ○ Agree
- ○ Neither agree nor disagree
- ○ Somewhat disagree
- ○ Disagree
- ○ Strongly disagree
- ○ I have not received vocational training at the school I attend.

I am happy with my current vocational education.

- ○ Strongly agree
- ○ Somewhat agree
- ○ Agree
- ○ Neither agree nor disagree
- ○ Somewhat disagree
- ○ Disagree
- ○ Strongly disagree
- ○ I currently attend a traditional school

I am happy with my current traditional education.

- ○ Strongly agree
- ○ Somewhat agree
- ○ Agree
- ○ Neither agree nor disagree
- ○ Somewhat disagree
- ○ Disagree
- ○ Strongly disagree
- ○ I currently attend a vocational school

Overall, I am happy with the education I am receiving, regardless of where I attend school.

- ○ Strongly agree
- ○ Somewhat agree
- ○ Agree
- ○ Neither agree nor disagree
- ○ Somewhat disagree
- ○ Disagree
- ○ Strongly disagree

I plan on going to college.

- ○ Yes

- ○ No
- ○ Maybe

Parent

What grade is your child in?

- ○ 9
- ○ 10
- ○ 11
- ○ 12

What school does your child attend?

Does your child attend a traditional school or a vocational school?

- ○ Traditional
- ○ Vocational

I had a choice in where my child attends high school.

- ○ Strongly agree
- ○ Somewhat agree
- ○ Agree
- ○ Neither agree nor disagree
- ○ Somewhat disagree
- ○ Disagree

- ○ Strongly disagree

What 3 factors mainly influenced your decision of where your child goes to school?

- ○ Tuition
- ○ Transportation
- ○ Proximity
- ○ Quality of Education
- ○ Child's Interest
- ○ Friends
- ○ Eligibility
- ○ School Size
- ○ Sports
- ○ Extracurricular Activities
- ○ Other
- ○ N/A

I resisted a vocational education for my child

- ○ True
- ○ False

Based on the previous question, why or why not did you resist a vocational high school education?

What positive assumptions do you have about vocational schools?

What negative assumptions do you have about vocational schools?

What positive assumptions do you have about traditional schools?

What negative assumptions do you have about traditional schools?

Is there a vocational school where your child can attend?

- ○ Yes
- ○ No

If you answered no to the previous question, if the option was available, would you have been interested in sending your child?

- ○ Yes
- ○ No

I believe in the value of vocational education.

- ○ Strongly agree
- ○ Somewhat agree
- ○ Agree
- ○ Neither agree nor disagree
- ○ Somewhat disagree
- ○ Disagree
- ○ Strongly disagree

I believe in the value of traditional education.

- ○ Strongly agree
- ○ Somewhat agree
- ○ Agree
- ○ Neither agree nor disagree
- ○ Somewhat disagree
- ○ Disagree
- ○ Strongly disagree

I perceive my child as being successful in the high school program they are enrolled in.

- ○ Strongly agree
- ○ Somewhat agree
- ○ Agree
- ○ Neither agree nor disagree
- ○ Somewhat disagree
- ○ Disagree
- ○ Strongly disagree

If your child is currently struggling with being successful, what do you think attributes to this?

I perceive my child as happy with their current high school program.

- ○ Strongly agree

- ○ Somewhat agree
- ○ Agree
- ○ Neither agree nor disagree
- ○ Somewhat disagree
- ○ Disagree
- ○ Strongly disagree

If your child is currently unhappy, what do you think attributes to this?